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# Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas

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**Abstract.**—The Strawberry River has been designated an Extraordinary Resource Water, an Ecologically Sensitive Water Body, and a Natural and Scenic Waterway. As such, it is particularly important that the biodiversity of this river system be documented thoroughly. The purpose of this research was to develop a comprehensive list of the aquatic macroinvertebrates of the Strawberry River and its major tributaries. The information was developed from a thorough literature review and by examining specimens housed in various collections of the Arkansas State University Museum of Zoology and collections of the authors. The latter included 9 collections at 4 sites along the mainstream and 17 collections from 8 tributaries. To date, 313 species of aquatic macroinvertebrates are known to occur in the Strawberry River system. Among the freshwater mussels, 1 is listed and 7 are ranked: *Leptodea leptodon* (Federal list-endangered, S1), *Cyprogenia aberti*, *Lasmigona costata*, and *Quadrula cylindrica* (S2), *Cyclonaias tuberculata*, *Strophitus undulatus*, and *Villosa lienosa* (S3). Of 25 stonefly species known to be endemic to the Interior Highlands, 7 occur in this system.

**Key words:**—Strawberry River, aquatic macroinvertebrates, freshwater mussels, stonefly, Federal list-endangered, *Leptodea leptodon*, *Cyprogenia aberti*, *Lasmigona costata*, *Quadrula cylindrica*, *Cyclonaias tuberculata*, *Strophitus undulatus*, *Villosa lienosa*.

## Introduction

The Strawberry River has been designated an Extraordinary Resource Water and an Ecologically Sensitive Water Body, as outlined by the Arkansas Water Quality Standards. It is also designated as a Natural and Scenic Waterway (ADPCE 1996). As such, it is particularly important that the biodiversity of this river system be documented thoroughly. The Strawberry River is a spring-fed, relatively clear stream in north-central Arkansas, typically consisting of wide, shallow pools separated by riffles. The river originates near Viola, Arkansas, and flows 177 km before entering the Black River at BR km 56.2, approximately 10.5 km above Lockheart Ferry. The drainage area is 2,100 km<sup>2</sup> (Beadles 1972). Principal tributaries are the Little Strawberry River, Piney Fork, North Big Creek, South Big Creek, Cooper Creek, Dry Creek, and Caney Creek. The Strawberry River arises in Ordovician Calico sandstone of lower Fulton County and winds through Cotter dolomite in Izard and Sharp counties. Midway into Lawrence County, the river passes through Powell limestone, then in rapid succession through Smithville and Black Rock limestone. As it nears its confluence with the Black River, the Strawberry River drops into the Quaternary Alluvium (Croneis 1930). Major soils adjacent to the river are chiefly of the Huntington and Elk series (SCS 1964). Mean annual rainfall is 112, 119, and 138 cm in Izard, Sharp and Lawrence counties, respectively. Air temperatures range from -25 to 40° C (Hickmon 1941).

No previous studies dealing with aquatic macroinvertebrates of the Strawberry River system have been comprehensive. Rather, they have been restricted to a few collections at a limited number of locations (e.g. Robison 1968; Robison and Harp 1971;

Beadles 1972; Harp 1972; Moss and Harp 1993; ADPCE 1996) or have focused on a target group of organisms (e.g. Harp 1989; Poulton and Stewart 1991; Rust 1993; Moulton and Stewart 1996).

The purpose of this research was to develop a comprehensive list of the aquatic macroinvertebrates of the Strawberry River and its major tributaries. Species of particular interest are discussed.

## Materials and Methods

The information to develop a list of the aquatic macroinvertebrates known to occur in the Strawberry River system was derived primarily from 4 sources (Table 1). A comprehensive review of the literature provided the nucleus. Aquatic macroinvertebrates previously collected and housed in the Adult Odonata Collection, Freshwater Mussel Collection and George L. Harp Aquatic Macroinvertebrate Collection of the Arkansas State University Museum of Zoology were inventoried. Mollusca collected from the Strawberry River mainstream in the 1970s by one of us (HWR) provided additional information. Both authors collected a series of samples during 1988-89 from tributaries that had received little or no previous attention.

Collections were made with a Turtex Indestructible™ dip net. Taxonomic usage follows Merritt and Cummins (1996) for aquatic insects, Gordon (1980) for Mollusca, and Smith (2001) for other aquatic macroinvertebrates. Common names of crayfishes follow Pflieger (1996), those of Mollusca follow Harris and Gordon (1990), and those of Odonata follow Paulson and Dunkle (1999).

We have endeavored to use the most current taxonomy. However, taxonomy, particularly that of aquatic macroinvertebrates, is dynamic. To minimize confusion, older names under which species have occurred in older literature have been noted (Table 2). For example, a small clubtail dragonfly that occurs in Arkansas, Kentucky, Missouri, and Tennessee, previously has been identified as *Stylogomphus albistylus*, an eastern species, but it was in fact an undescribed species. Cook and Lauder milk (2003) have recently described it as *Stylogomphus sigmastylus*.

## Results and Discussion

This survey encompassed 9 collections at 4 sites along the Strawberry River mainstream and 14 collections on tributaries (Table 1). The authors or their former students were associated with nearly all collections made. The notable exception was the Plecoptera survey by Poulton and Stewart (1991), but even this comprehensive study began with verification of the identities of the stoneflies in the possession of the authors.

Because the purposes and methodologies varied greatly among studies, as well as number of times a given site was visited, analyses of data are restricted.

To date, 313 species of aquatic macroinvertebrates are known to occur in the Strawberry River system (Table 2). Significant records are as follows.

Among the Unionoida, *Leptodea leptodon*, the scaleshell, was reported from the Strawberry River by Harris et al. (1997). This species is on the federal list of endangered species and is ranked in Arkansas as S1, defined as typically 5 or fewer estimated occurrences in the state or only a few remaining individuals, may be vulnerable to extirpation. Additionally, in Arkansas 3 Strawberry River species are ranked as S2, *Cyprogenia aberti*, *Lasmigona costata*, and *Quadrula cylindrica*. Individuals of these species are very rare with typically 5-20 estimated occurrences or with many individuals in few occurrences; they are often susceptible to becoming extirpated. Finally, *Cyclonaias tuberculata*, *Strophitus undulatus*, and *Villosa lienosa* are ranked as S3. Individuals of these species are rare to uncommon with typically 20-100 estimated occurrences or fewer occurrences but with large numbers of individuals in some populations. These populations may be susceptible to large-scale disturbances.

*Baetisca obesa* was collected from the lower Strawberry River, at St. Hwy. 25. This is only the second record for this species in Arkansas. Cochran and Harp (1990) first reported this mayfly from the St. Francis Sunken Lands. At both locations, the rivers are of medium size and have moderate current over a sand substrate. The Strawberry River site is the only location reported for Arkansas where *B. lacustris* and *B. obesa* occur together. *B. lacustris* characteristically inhabits smaller, less turbid streams with rubble substrate.

Of the 25 stonefly species listed as regional endemics

by Poulton and Stewart (1991), 7 are known to occur in the Strawberry River system. These are *Allocapnia mohri*, *Zealuctra warreni*, *Strophopteryx cucullata*, *Neoperla falayah*, *N. osage*, *N. robisoni* and *Isoperla ouachita*. Additionally, *Attaneuria ruralis*, which occurs only in Arkansas, Illinois, Kansas, and Missouri, is a species rarely collected.

Seven specimens of the predaceous diving beetle *Heterosternuta ouachitus* were collected, 2 from the Strawberry River at St. Hwy. 354 (Harp 1989), 2 at Hars Creek and 3 at McJunkins Branch. Prior to that date, the collection of only 21 specimens had ever been reported. Unlike most predaceous diving beetles, *Heterosternuta* species prefer the interstices of rocks at the edges of riffles in headwater streams, a microhabitat that is rarely sampled. The center of distribution for *H. ouachitus* is the Interior Highlands. While this species is widely distributed, it is quite uncommon. Of 30 samples taken in its preferred habitat, 9 contained a total of 34 specimens among 981 total *Hydroporus* (general sense) individuals (Harp 1989). The 5 specimens collected at Hars Creek and McJunkins Branch constituted only 2.7% of the *Hydroporus* from those streams.

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**George L. Harp and Henry W. Robison****Table 1. Collecting sites (noted by date and collectors) and literature sources for aquatic macroinvertebrate taxa, Strawberry River System.**

1. Strawberry R. at St. Hwy. 354, 5mi W Horseshoe Bend, SW¼Sec7, T18N, R8W, Izard Co. 4 Sep 88, GL Harp (1a); 1995, Richard Mitchell (1b).
2. South Big Cr. at St. Hwy. 115, 1.5mi NE Calamine, NE¼Sec23, T16N, R4W, Sharp Co. 19 Aug 86, GL Harp (2a); 5 Sep 88, Billy Justice & GL Harp (2b); 1 Apr 95, Bill Posey and Aquatic Entomology Class (2c).
3. Cooper Cr., 1.5mi W Smithville, NW¼Sec32, T17N, R3W, Lawrence Co. 1 Jul 64, L Tucker (3a); 25 Jun 71, GL Harp (3b), 11 Sep 71, GL Harp (3c); 1974, Herb Athearn (3d); 6 Oct 78, T Pickett (3e); 10 Jul 79, HE Barton (3f); 5 Sep 88, B Justus & GL Harp (3g); 19 Feb 95, B Posey & GL Harp (3h).
4. Greasy Cr., 3mi NNW Union, SE¼Sec21, T19N, R9W, Fulton Co. 23 Sep 89. HW Robison & GL Harp.
5. Unnamed tributary of the Strawberry R. at a section road ford, 5mi WNW Franklin, SE¼Sec30, T18N, R8W, Izard Co. 23 Sep 89. HW Robison & GL Harp.
6. McJunkins Branch, 2.2mi SE Franklin, SE¼Sec4, T17N, R7W, Izard Co. 23 Sep 89. HW Robison & GL Harp
7. Strawberry R. at St. Hwy. 395, 7mi W Salem, SW¼Sec10, T19N, R9W, Fulton Co. 23 Sep 89. HW Robison & GL Harp
8. Hars Cr. 0.7mi S St. Hwy. 56, 0.2mi E Izard Co line, SW¼Sec30, T18N, R6W, Sharp Co. 23 Sep 89. HW Robison & GL Harp
9. Strawberry R. at U.S. Hwy. 167, 2mi N Evening Shade, NE¼Sec 27, T17N, R6W, Sharp Co. 21 Aug 76, GL Harp (9a); 7 Aug 78, GL Harp (9b); 24 Sep 89, HW Robison & GL Harp (9c); 3 Jun 90, GL Harp (9d).
10. Mill Cr. at St Hwy 56, Evening Shade, NE¼Sec3, T16N, R6W, Sharp Co. 24 Sep 89, HW Robison & GL Harp.
11. Strawberry R. at St. Hwy. 25 bridge, ~2mi SW Lynn, NE¼Sec34, T16N, R3W, Lawrence Co. 22 Jul 90, GLH (11a); 1 Apr 95, B Posey and Aquatic Entomology Class (11b).
12. Strawberry R. ~1.3mi N Poughkeepsie, NE¼Sec26, T17N, R5W, Lawrence Co. 1 Apr 95, B Posey and Aquatic Entomology Class.
13. North Big Cr. ~1mi SE Center, NW¼Sec10, T17N, R5W, Sharp Co. 31 May 05. GL Harp.
14. Aquatic macroinvertebrates documented from the Strawberry R. by Robison and Harp (1971).
15. Aquatic macroinvertebrates documented from three stations along the Strawberry R. by Harp (1972).
16. Freshwater mussels documented from the Strawberry R. mainstream during the 1970s by HW Robison.
17. Stoneflies documented from the Strawberry R. System by Poulton and Stewart (1991).
18. Aquatic macroinvertebrates documented from North Big Cr. by Moss and Harp (1993).
19. Freshwater mussels documented from the Strawberry R. mainstem by Rust (1993).
20. Caddisflies documented from the Strawberry River System by Moulton and Stewart (1996).
21. Aquatic macroinvertebrates documented from the Strawberry River System by ADPCE (1996).
22. Arkansas crayfishes database.
23. Report listing rare and endangered Unionacea by Harris et al. 1997.



## Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System.

Scientific Name	Common Name	Location (Table 1)
PORIFERA	Sponges	
Spongillidae	Freshwater sponges	
Sp. 1	Freshwater sponges	18
PLATYHELMINTHES	Unsegmented flatworms	
Class Turbellaria	Turbellarians	
Order Tricladida	Triclads	
Planariidae	Planarians	14
<i>Dugesia</i> sp.	Planarian	15, 18
NEMATOMORPHA	Horsehair worms	4, 10
Gordiidae	Gordian worms	
ANNELIDA	Segmented roundworms	
Class Oligochaeta	Oligochaetes	14, 15, 21
Order Lumbriculida	Lumbriculids	
Lumbriculidae	Lumbriculids	
Sp. 1	Lumbriculid	18
Order Branchiobdellida	Branchiobdellid worm	
Branchiobdellidae	Branchiobdellid worm	
Sp. 1	Branchiobdellid worm	18
Class Hirudinea	Leeches	
Order Rhynchobdellida	Rhynchobdellid leeches	14
Glossiphoniidae	Glossiphoniid leeches	
<i>Batrachobdella</i> sp.	Glossiphoniid leech	18
<i>Helobdella</i> sp.	Glossiphoniid leech	4, 18
<i>Placobdella</i> sp.	Glossiphoniid leech	17
MOLLUSCA	Molluscs	
Class Gastropoda	Snails, limpets (Univalves)	21
Order Limnophila	Pulmonate snails	
Ancylidae	Limpets	
<i>Ferrisia rivularis</i>	Limpet	9c, 15, 18
Planorbidae	Planorbids	
<i>Gyraulus</i> sp.	Planorbid	18
<i>Helisoma</i> sp.	Planorbid	9c
Pleuroceridae	Pleurocerids	14
<i>Elmia</i> (=Goniobasis) <i>ovoidea</i>	Pleurocerid	9c, 10, 15
<i>Pleurocera acuta</i>	Pleurocerid	3d
Viviparidae	Viviparids	
<i>Campeoloma</i> sp.	Viviparid	9c, 18
Physidae	Physids	
<i>Physella</i> (=Physa) sp.	Physid	4, 5, 6, 7, 8, 9c, 10, 18

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
Class Pelecypoda	Clams, mussels (Bivalves)	
Unionoida	Unionoid mussels	
Sphaeriidae	Fingernail clams	18
<i>Musculium</i> sp.	Fingernail clam	4
<i>Sphaerium</i> sp.	Fingernail clam	7
<i>S. striatinum</i>	Fingernail clam	15
Unionidae	Unionids	
<i>Actinonaias ligamentina</i>	Mucket	16, 19
<i>Amblema plicata</i>	Threeridge	16, 19
<i>Cyclonaias tuberculata</i>	Purple wartyback	16, 19
<i>Cyprogenia aberti</i>	Western fanshell	19
<i>Elliptio dilata</i>	Spike	19
<i>Fusconaia ebena</i>	Ebonysell	19
<i>F. flava</i>	Wabash pigtoe	19
<i>Lampsilis teres</i>	Yellow sandshell	16
<i>Lasmigona complanata</i>	White heelsplitter	19
<i>L. costata</i>	Fluted-shell	19
<i>Leptodea fragilis</i>	Fragile papershell	16, 19
<i>L. leptodon</i>	Scaleshell	23
<i>Legumia recta</i>	Black sandshell	19
<i>Obliquaria reflexa</i>	Threehorn wartyback	19
<i>Potamilus purpurata</i>	Bleufer	16, 19
<i>Pyganodon grandis</i>	Giant floater	16, 18
<i>Quadrula cylindrica</i>	Rabbitsfoot	16
<i>Q. metanevra</i>	Monkeyface	16, 19
<i>Q. pustulosa</i>	Pimpleback	16, 19
<i>Strophitus undulatus</i>	Squawfoot	16
<i>Tritogonia verrucosa</i>	Pistolgrip	16, 19
<i>Truncilla truncata</i>	Deertoe	16, 19
<i>Villosa lienosa</i>	Little spectaclecase	16
Veneroida	Veneroid mussels	
Corbiculidae	Asiatic clam	
<i>Corbicula fluminea</i>	Asiatic clam	9c, 16, 18, 21
ARTHROPODA		
Class Arachnida	Arachnids	
Hydracarina	Water mites	14, 18
<i>Lebertia</i> sp.	Water mite	15
Class Crustacea	Crustaceans	
Order Isopoda	Isopods	
Asellidae	Sow bugs or pill bugs	
<i>Caecidotea</i> sp.	Sow bug	11b
<i>C. militaris</i>	Sow bug	15

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Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>Lirceus</i> sp.	Sow bug	2c, 3h, 6, 11b, 15, 18, 21
Order Amphipoda	Amphipods	
Crangonyctidae	Sideswimmers, scuds	
<i>Crangonyx gracilis</i>	Sideswimmer	15
<i>Synurella</i> sp.	Sideswimmer	11b, 12
Gammaridae	Sideswimmers, scuds	
<i>Gammarus</i> sp.	Sideswimmer	3g, 3h
<i>G. minus</i>	Sideswimmer	10
Talitridae	Sideswimmers, scuds	
<i>Hyalella azteca</i>	Sideswimmer	6, 9c, 12, 15, 18
Order Decapoda	Decapod crustaceans	
Palaemonidae	Freshwater shrimp	
<i>Palaemonetes kadiakensis</i>	Freshwater shrimp	11b, 15
Cambaridae	Crayfishes	11b
<i>Fallicambarus fodiens</i>	Digger crayfish	22
<i>Orconectes</i> sp.	Crayfish	3g, 4, 5, 6, 10, 15, 18
<i>O. eupunctus</i>	Coldwater crayfish	22
<i>O. ozarkae</i>	Ozark crayfish	22
<i>O. punctimanus</i>	Spothanded crayfish	22
<i>O. virilis</i>	Northern crayfish	22
Class Insecta		
Order Ephemeroptera	Mayflies	
Baetidae	Baetid mayflies	
<i>Acentrella</i> sp.	Baetid mayfly	1b
<i>Baetis</i> sp.	Baetid mayfly	1b, 2c, 10, 11b, 12, 18, 21
<i>Callibaetis fluctuans</i>	Baetid mayfly	8
<i>Dipheter hageni</i>	Baetid mayfly	12
<i>Procloeon rubropictum</i>	Baetid mayfly	2c
<i>P. rufostrigatum</i>	Baetid mayfly	11b
<i>Pseudocloeon</i> sp.	Baetid mayfly	14, 15, 21
Baetiscidae		
<i>Baetisca</i> sp.	Baetiscid mayfly	11b
<i>B. lacustris</i> (=bajkovi)	Baetiscid mayfly	2c, 11b, 15
<i>B. obesa</i>	Baetiscid mayfly	11b
Caenidae	Caenid mayfly	
<i>Bracyrcercus</i> sp.	Caenid mayfly	14
<i>Caenis</i> sp.	Caenid mayfly	2c, 8, 12, 14, 18, 21
Ephemeridae	Burrowing mayfly	
<i>Hexagenia</i> sp.	Burrowing mayfly	18
<i>H. atrocaudata</i>	Burrowing mayfly	8c
<i>H. limbata</i>	Burrowing mayfly	15
Ephemerellidae	Ephemerellid mayfly	12
<i>Ephemerella</i> sp.	Ephemerellid mayfly	18

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>E. argo</i>	Ephemerellid mayfly	15
<i>E. deficiens</i>	Ephemerellid mayfly	15
<i>E. dorothea</i>	Ephemerellid mayfly	1b, 2c, 3h, 11b, 12, 15
<i>E. invaria</i>	Ephemerellid mayfly	11b
<i>E. needhami</i>	Ephemerellid mayfly	2c, 11b, 15
<i>E. rotunda</i>	Ephemerellid mayfly	11b
<i>E. simplex</i>	Ephemerellid mayfly	15
<i>E. sordida</i>	Ephemerellid mayfly	15
<i>Seratella</i> sp.	Ephemerellid mayfly	10b
<i>S. sordida</i>	Ephemerellid mayfly	12
Heptageniidae	Heptageniid mayfly	
<i>Heptagenia</i> sp.	Heptageniid mayfly	18
<i>Nixe</i> sp.	Heptageniid mayfly	18
<i>Stenacron interpunctatum</i>	Heptageniid mayfly	1b, 3g, 18
<i>Stenonema</i> sp.	Heptageniid mayfly	10, 14, 18, 21
<i>S. ares</i>	Heptageniid mayfly	15
<i>S. femoratum</i>	Heptageniid mayfly	1a, 3h, 6, 7, 9c, 11b, 15, 18
<i>S. luteum</i>	Heptageniid mayfly	2c, 3h, 11b
<i>S. mediopunctatum</i>	Heptageniid mayfly	1b, 2c, 3h, 11b, 12, 18
<i>S. nepotellum</i>	Heptageniid mayfly	15
<i>S. pulchellum</i>	Heptageniid mayfly	18
<i>S. terminatum</i>	Heptageniid mayfly	7, 11b, 12, 18
Isonychiidae	Isonychiid mayfly	
<i>Isonychia</i> sp.	Isonychiid mayfly	1b, 2b, 2c, 3g, 3h, 5, 6, 10, 11b, 12, 14, 15, 18, 21
Leptophlebiidae	Leptophlebiid mayfly	2c
<i>Choroterpes</i> sp.	Leptophlebiid mayfly	18
<i>C. basalis</i>	Leptophlebiid mayfly	5, 6
<i>Paraleptophlebia</i> sp.	Leptophlebiid mayfly	15
<i>P. guttata</i>	Leptophlebiid mayfly	1b, 2c, 3h, 11b
Polymitarcyidae	Burrowing mayfly	
<i>Ephoron</i> sp.	Burrowing mayfly	14, 21
Potamanthidae	Burrowing mayfly	
<i>Anthopotamus</i> (=Potamanthus) sp.	Burrowing mayfly	12, 14, 15
Siphonuridae	Siphonurid mayfly	
<i>Ameletus</i> sp.	Siphonurid mayfly	3h
<i>Siphonurus</i> sp.	Siphonurid mayfly	11b
<i>S. marshalli</i>	Siphonurid mayfly	2c
Tricorythidae	Tricorythid mayfly	
<i>Tricorythodes</i> sp.	Tricorythid mayfly	6, 18, 21
<i>T. atratus</i>	Tricorythid mayfly	3h, 11b, 15
Order Odonata	Dragonflies, damselflies	
Calopterygidae	Broad-winged damselflies	
<i>Calopteryx maculata</i>	Ebony jewelwing	1b, 2a, 2b, 2c, 3g, 5, 10, 11b, 18



Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>Hetaerina</i> sp.	Rubyspot damselfly	2b, 11b
<i>H. americana</i>	American rubyspot	2c, 3e, 9b, 9c, 18
<i>H. titia</i>	Smoky rubyspot	2a
Coenagrionidae	Pond damselfs	
<i>Amphiagrion</i> sp.?	Red damself	15 (probably <i>Ischnura</i> )
<i>Argia</i> sp.	Dancer	1a, 2b, 2c, 4, 5, 6, 9c, 10, 11b, 12, 15, 18
<i>A. apicalis</i>	Blue-fronted dancer	9b
<i>A. fumipennis violacea</i>	Variable dancer	9b
<i>A. moesta</i>	Powdered dancer	9b
<i>A. plana</i>	Springwater dancer	9b, 10
<i>A. sedula</i>	Blue-ringed dancer	2a, 3e, 9b
<i>A. tibialis</i>	Blue-tipped dancer	9b, 9d
<i>A. translata</i>	Dusky dancer	9b
<i>Enallagma</i> sp.	Bluet	1a, 2b, 2c, 4, 6, 7, 8, 9c, 11b, 12, 18
<i>Ischnura</i> sp.	Forktail	4, 6, 7, 15, 18
<i>I. posita</i>	Fragile forktail	9b
Aeshnidae	Darners	14, 18
<i>Basiaeschna janata</i>	Springtime darner	2b, 3g, 3h, 4, 5, 6, 9c, 10, 18
<i>Boyeria vinosa</i>	Fawn darner	2b, 10, 12
Gomphidae	Clubtails	
<i>Arigomphus lentulus</i>	Stillwater clubtail	9c
<i>Dromogomphus</i> sp.	Spinyleg clubtail	1a, 2b, 3g, 12
<i>D. spinosus</i>	Black-shouldered spinyleg	3e, 3h, 4, 9a, 9c, 15
<i>D. spoliatus</i>	Flag-tailed spinyleg	3h
<i>Erpetogomphus designatus</i>	Eastern ringtail dragonfly	9c
<i>Gomphus</i> sp.	Clubtail	2b, 2c, 4, 9c, 10, 11b
<i>G. externus</i>	Plains clubtail	12
<i>G. graslinellus</i> ?	Pronghorn clubtail	5
<i>G. lividus</i>	Ashy clubtail	11a
<i>G. ozarkensis</i>	Ozark clubtail	13
<i>Hagenius brevistylus</i>	Dragonhunter	2c, 3c, 3g, 9a, 11b, 12
<i>Ophiogomphus westfalli</i>	Westfall's snaketail	1a, 2b
<i>Progomphus obscurus</i>	Common sanddragon	2b, 2c, 3b, 3g, 3h, 11b
<i>Stylogomphus sigmastylus</i>	Western least clubtail	2c, 3g, 6, 7, 9c, 10, 18
<i>Stylurus plagiatus</i>	Russet-tipped clubtail	11a
Corduligastridae	Spiketails	
<i>Cordulegaster maculata</i> ?	Twin-spotted spiketail	10
Macromiidae	Cruisers	
<i>Didymops transversa</i>	Stream cruiser	11b
<i>Macromia</i> sp.	River cruiser	1a, 2b, 2c, 3g, 9c, 11b, 12, 14, 18
<i>M. illinoensis</i>	Illinois river cruiser	11a, 15
Corduliidae	Emeralds	
<i>Epitheca cynosura</i>	Common baskettail	1a, 4

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>E. princeps</i>	Prince baskettail	2b, 4, 9c
<i>Neurocordulia xanthosoma</i>	Orange shadowdragon	3a, 9d
<i>Somatochlora linearis</i>	Mocha emerald	5, 8
Libellulidae	Skimmers	15, 18
<i>Dythemis velox</i>	Swift setwing	9a
<i>Erythemis simplicicollis</i>	Eastern pondhawk	3c, 4
<i>Libellula</i> sp.	Skimmer	1a, 11b
<i>L. cyanea</i>	Eastern spangled skimmer	3b, 4
<i>L. luctuosa</i>	Pied skimmer	4, 8
<i>L. vibrans</i>	Great blue skimmer	3c, 4, 9a
<i>Plathemis lydia</i>	Common whitetail	4, 5, 9a
<i>Sympetrum</i> sp.	Meadowhawk	1a
<i>S. ambiguus</i>	Blue-faced meadowhawk	9b
Order Plecoptera	Stoneflies	
Capniidae		
<i>Allocapnia granulata</i>	Capniid stonefly	17
<i>A. mohri</i>	Capniid stonefly	17
<i>A. mystica</i>	Capniid stonefly	17
<i>A. rickerti</i>	Capniid stonefly	17
Leuctridae	Winter stoneflies	
<i>Leuctra tenuis</i>	Winter stonefly	17
<i>Zealeuctra classeni</i>	Winter stonefly	17
<i>Z. narfi</i>	Winter stonefly	17
<i>Z. warreni</i>	Winter stonefly	17
Taeniopterygidae	Taeniopterygid stoneflies	
<i>Strophopteryx</i> sp.	Taeniopterygid stonefly	2c
<i>S. cucullata</i>	Taeniopterygid stonefly	17
<i>S. fasciata</i>	Taeniopterygid stonefly	17
<i>Taeniopteryx</i> sp.	Taeniopterygid stonefly	3h
<i>T. burksi</i>	Taeniopterygid stonefly	17
Nemouridae	Nemourid stoneflies	
<i>Amphinemura</i> sp.	Nemourid stonefly	1b
<i>A. delosa</i>	Nemourid stonefly	17
<i>Prostoia</i> sp.	Nemourid stonefly	1b
<i>P. completa</i>	Nemourid stonefly	17
Chloroperlidae	Chloroperlid stoneflies	
<i>Haploperla</i> sp.	Chloroperlid stonefly	1b
<i>H. brevis</i>	Chloroperlid stonefly	17
Perlidae	Perlid stoneflies	
<i>Acroneuria</i> sp.	Perlid stonefly	2c, 3h, 18
<i>A. evoluta</i>	Perlid stonefly	17
<i>A. perplexa</i>	Perlid stonefly	17
<i>Agneta capitata</i>	Perlid stonefly	11b

## Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>Anacroneuria</i> sp.	Perlid stonefly	18
<i>Attaneuria ruralis</i>	Perlid stonefly	2c, 12
<i>Neoperla</i> sp.	Perlid stonefly	17, 18, 21
<i>N. choctaw</i>	Perlid stonefly	17
<i>N. clymene</i>	Perlid stonefly	14, 15, 17
<i>N. falayah</i>	Perlid stonefly	17
<i>N. osage</i>	Perlid stonefly	2c, 17
<i>N. robisoni</i>	Perlid stonefly	17
<i>Paragnetina kansensis</i>	Perlid stonefly	17
<i>Perlesta</i> sp.	Perlid stonefly	1b, 15
<i>P. cinctipes</i>	Perlid stonefly	17
<i>P. decipiens</i>	Perlid stonefly	17
<i>P. shubuta</i>	Perlid stonefly	17
<i>Perlinella drymo</i>	Perlid stonefly	17
<i>P. ephyre</i>	Perlid stonefly	17
<i>Phasganophora</i> sp.	Perlid stonefly	18
Perlodidae	Perlodid stoneflies	
<i>Hydroperla crosbyi</i>	Perlodid stonefly	17
<i>Isoperla</i> sp.	Perlodid stonefly	1b, 2c, 3h, 15
<i>I. coushatta</i>	Perlodid stonefly	2c, 11b, 17
<i>I. dicala</i>	Perlodid stonefly	2c, 12
<i>I. mohri</i>	Perlodid stonefly	2c, 17
<i>I. namata</i>	Perlodid stonefly	17
<i>I. ouachita</i>	Perlodid stonefly	17
Order Hemiptera	True bugs	
Belostomatidae	Giant water bugs	
Sp. 1	Giant water bug	18
Corixidae	Water boatmen	15
<i>Hesperocorixa</i> sp.	Water boatman	5, 8, 18
<i>Sigara</i> sp.	Water boatman	5, 7, 8, 10, 18
<i>S. modesta</i>	Water boatman	1a, 18
<i>Trichocorixa</i> sp.	Water boatman	4, 9c, 18
Gelastocoridae	Toad bugs	
<i>Gelastocoris oculatus oculatus</i>	Toad bug	4, 5, 18
Gerridae	Water striders	
<i>Gerris marginatus</i>	Water strider	1a, 15
<i>G. nebularis</i>	Water strider	15
<i>G. remigis</i>	Water strider	7, 10
<i>Limnoporus canaliculatus</i>	Water strider	5, 6, 8, 9c, 10
<i>Metrobates hesperius</i>	Water strider	2b
<i>Neogerris</i> sp.	Water strider	18
<i>Rheumatobates</i> sp.	Water strider	6, 18
<i>Trepobates</i> sp.	Water strider	1a, 8

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>T. pictus</i>	Water strider	4
<i>T. subnitidus</i> ?	Water strider	6
Hebridae	Velvet water bugs	
<i>Hebrus</i> sp.	Velvet water bug	18
<i>H. concinnus</i>	Velvet water bug	6
Hydrometridae	Water measurers	
<i>Hydrometra hungerfordi</i>	Water measurer	5
<i>H. martini</i>	Water measurer	2b, 3f
Mesoveliidae	Water treaders	
<i>Mesovelia</i> sp.	Water treader	1a, 2b, 3g, 18
<i>M. mulsanti</i>	Water treader	6
Naucoridae	Creeping water bugs	
<i>Pelocoris</i> sp.	Creeping water bug	2c
Nepidae	Water scorpions	
<i>Ranatra kirkaldyi</i>	Water scorpion	1a, 4
Notonectidae	Backswimmers	
<i>Notonecta indica</i>	Backswimmer	5
Pleidae	Pygmy backswimmers	
<i>Neoplea</i> sp.	Pygmy backswimmer	4, 18
Veliidae	Broad-shouldered water strider	
<i>Microvelia</i> sp.	Small water strider	1a, 2c, 3g, 18
<i>M. americana</i>	Small water strider	5, 7, 10
<i>M. hinei</i>	Small water strider	8
<i>Rhagovelia</i> sp.	Broad-shouldered water strider	2b, 3g, 18
<i>R. knighti</i>	Broad-shouldered water strider	6, 10
<i>Steinovelia stagnalis</i>	Small water strider	4
Order Megaloptera	Alderflies, dobsonflies, fishflies	
Corydalidae	Dobsonflies, fishflies	
<i>Chauliodes pectinicornis</i>	Fishfly	7, 9c
<i>Corydalus cornutus</i>	Hellgrammite	2b, 2c, 3h, 7, 12, 14, 15, 18
<i>Nigronia serricornis</i>	Fishfly	3g
Sialidae	Alderflies	
<i>Sialis</i> sp.	Alderfly	1a, 4, 5, 7, 9c, 10, 14, 18
Order Trichoptera	Caddisflies, caddisworms	
Glossosomatidae	Glossosomatid caddisflies	
<i>Agapetus illini</i>	Glossosomatid caddisfly	20
Helicopsychidae	Helicopsychid caddisflies	
<i>Helicopsyche</i> sp.	Helicopsychid caddisfly	2c, 10, 18, 21
<i>H. borealis</i>	Helicopsychid caddisfly	20
Hydropsychidae	Hydropsychid caddisflies	
<i>Ceratopsyche bronta</i>	Hydropsychid caddisfly	20
<i>C. morosa</i>	Hydropsychid caddisfly	20
<i>Cheumatopsyche</i> sp.	Hydropsychid caddisfly	1b, 2b, 10, 14, 15, 18, 21

## Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>C. campyla</i>	Hydropsychid caddisfly	20
<i>C. miniscula</i>	Hydropsychid caddisfly	20
<i>C. oxa</i>	Hydropsychid caddisfly	20
<i>C. pettiti</i>	Hydropsychid caddisfly	20
<i>Hydropsyche</i> sp.	Hydropsychid caddisfly	2c, 11b, 12
<i>Macrostemum</i> (=Macromia) sp.	Hydropsychid caddisfly	15
Hydroptilidae	Hydroptilid caddisflies	
Sp. 1	Hydroptilid caddisfly	18
Leptoceridae	Leptocerid caddisflies	
<i>Ceraclea cancellata</i>	Leptocerid caddisfly	20
<i>C. tarsipunctata</i>	Leptocerid caddisfly	20
<i>C. transversa</i>	Leptocerid caddisfly	20
<i>Oecetis</i> sp.	Leptocerid caddisfly	15
<i>O. inconspicua</i>	Leptocerid caddisfly	20
<i>O. persimilis</i>	Leptocerid caddisfly	20
<i>Triaenodes flavescens</i>	Leptocerid caddisfly	20
<i>T. ignitus</i>	Leptocerid caddisfly	20
Limnephilidae	Limnephilid caddisflies	
<i>Pycnopsyche</i> sp.	Limnephilid caddisfly	2b, 3g, 3h, 18
Philopotamidae	Philopotamid caddisflies	
<i>Chimarra</i> sp.	Philopotamid caddisfly	1b, 3h, 5, 7, 10, 14, 15, 18, 21
<i>C. feria</i>	Philopotamid caddisfly	20
Polycentropodidae	Polycentropodid caddisflies	
<i>Cyrnellus</i> sp.	Polycentropodid caddisfly	3h
<i>Neureclipsis</i> sp.	Polycentropodid caddisfly	3h
<i>Polycentropus</i> sp.	Polycentropodid caddisfly	15, 20, 21
Psychomyiidae	Psychomyiid caddisflies	
<i>Psychomyia</i> sp.	Psychomyiid caddisflies	21
<i>P. flavida</i>	Psychomyiid caddisfly	20
Rhyacophilidae	Rhyacophilid caddisflies	
<i>Rhyacophila</i> sp.	Rhyacophilid caddisfly	1b
<i>R. fenestra</i>	Rhyacophilid caddisfly	20
Order Lepidoptera	Butterflies, moths	
Pyrilidae	Pyrilid moths	
<i>Petrophila</i> (=Elophila) sp.	Pyrilid moth	14, 15, 18
Order Coleoptera	Beetles	
Anthicidae	Anthicid beetles	
Sp. 1	Anthicid beetle	7
Curculionidae	Weevils	
<i>Lixus</i> sp.	Weevil	18
Dryopidae	Long-toed water beetles	
<i>Helichus</i> sp.	Long-toed water beetle	1a, 1b, 2b, 2c, 3g, 10, 11b, 18
<i>H. lithophilus</i>	Long-toed water beetle	5, 6, 7, 8, 9c



Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
Dytiscidae	Predaceous diving beetles	
<i>Agabus ambiguus</i> ?	Predaceous diving beetle	7
<i>Copelatus chevrolati renovatusi</i>	Predaceous diving beetle	6
<i>Coptotomus venustus</i>	Predaceous diving beetle	7, 9c
<i>Heterosternuta ouachitus</i>	Predaceous diving beetle	1a, 6, 8
<i>H. pulcher</i>	Predaceous diving beetle	1a, 6, 8
<i>H. wickhami</i>	Predaceous diving beetle	1a, 2b, 6, 8
<i>Hydroporus</i> sp. 1	Predaceous diving beetle	2b, 3g, 3h, 4, 5, 7, 9c, 10, 18
<i>H.</i> sp. 2	Predaceous diving beetle	4, 5, 7, 9c, 10
<i>H.</i> sp. 3	Predaceous diving beetle	4, 5
<i>H.</i> sp. 4	Predaceous diving beetle	4
<i>H.</i> sp. 5	Predaceous diving beetle	4
<i>H.</i> sp. 6	Predaceous diving beetle	4
<i>H. rufilabris</i>	Predaceous diving beetle	1a, 6
<i>Hydrovatus</i> sp.	Predaceous diving beetle	4
<i>Ilybius biguttulus</i>	Predaceous diving beetle	5
<i>Laccophilus</i> sp.	Predaceous diving beetle	3h
<i>L. fasciatus rufus</i>	Predaceous diving beetle	5, 7, 10
<i>L. maculatus maculatus</i>	Predaceous diving beetle	4, 5
<i>L. proximus proximus</i>	Predaceous diving beetle	4, 6
<i>Neobidessus</i> sp.	Predaceous diving beetle	5
<i>Neoporus blanchardi</i>	Predaceous diving beetle	2b
<i>N. clypealis</i>	Predaceous diving beetle	1a, 8
<i>N. dimidiatus</i>	Predaceous diving beetle	6, 8
<i>N. shermani</i>	Predaceous diving beetle	1a, 2b, 6, 8
<i>N. striatopunctipennis</i>	Predaceous diving beetle	2b
<i>N. undulatus</i>	Predaceous diving beetle	8
<i>Thermonectus basillaris</i>	Predaceous diving beetle	8
<i>Uvarus</i> sp.	Predaceous diving beetle	4, 11b, 18
Elmidae	Riffle beetles	3h, 14, 15
<i>Ancyronyx variegata</i>	Riffle beetle	2c
<i>Dubiraphia</i> sp. 1	Riffle beetle	2b, 9c, 18
<i>D.</i> sp. 2	Riffle beetle	18
<i>Macronychus glabratus</i>	Riffle beetle	1b, 2b, 2c, 3g, 7
<i>Optioservus</i> sp.	Riffle beetle	18
<i>Stenelmis</i> sp.	Riffle beetle	1a, 1b, 2b, 3g, 11b, 18, 21
<i>S. crenata</i>	Riffle beetle	6
Gyrinidae	Whirligig beetles	
<i>Dineutus</i> sp.	Whirligig beetle	18, 21
<i>Dineutus carolinus</i>	Whirligig beetle	9c
<i>D. ciliatus</i>	Whirligig beetle	1a, 3h, 5, 6, 7
<i>D. discolor</i>	Whirligig beetle	15
<i>D. emarginatus</i>	Whirligig beetle	9c

## Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
<i>D. serrulatus</i>	Whirligig beetle	2c, 3h
<i>Gyretes sinuatus</i>	Whirligig beetle	15
<i>Gyrinus</i> sp.	Whirligig beetle	1a, 15
<i>G. woodruffi</i>	Whirligig beetle	9c
Halipidae	Crawling water beetles	
<i>Haliplus fasciatus</i>	Crawling water beetle	8
<i>Peltodytes dispersus</i>	Crawling water beetle	8
<i>P. dunavani</i>	Crawling water beetle	1a, 4, 6, 8, 18
<i>P. duodecimpunctatus</i>	Crawling water beetle	1a, 2c, 3h, 4, 5, 6, 7, 8, 12, 18
<i>P. festivus</i>	Crawling water beetle	4
<i>P. litoralis</i>	Crawling water beetle	1a, 4, 18
<i>P. muticus</i>	Crawling water beetle	4
<i>P. sexmaculatus</i>	Crawling water beetle	1a, 4, 11b, 18
Helophoridae	Water scavenger beetle	
<i>Helophorus</i> sp.	Water scavenger beetle	18
Hydrophilidae	Water scavenger beetles	
Sphaeridiinae	Water scavenger beetle	1a, 3g
<i>Berosus</i> sp. 1	Water scavenger beetle	1a, 4, 18
<i>B.</i> sp. 2	Water scavenger beetle	4
<i>Crenitus?</i> sp.	Water scavenger beetle	5
<i>Enochrus</i> sp.	Water scavenger beetle	4, 9c, 18
<i>E. ochraceus</i>	Water scavenger beetle	1a, 8
<i>E. perplexus</i>	Water scavenger beetle	6
<i>E. pygmaeus nebulosus</i>	Water scavenger beetle	1a, 2b, 8, 18
<i>Helochares</i> sp.	Water scavenger beetle	1a, 4, 5, 18
<i>Hydrochus</i> sp.	Water scavenger beetle	1a, 4
<i>Laccobius</i> sp.	Water scavenger beetle	1a, 4, 7
<i>Paracymus</i> sp.	Water scavenger beetle	1a, 18
<i>Tropisternus</i> sp.	Water scavenger beetle	18
<i>T. collaris mexicanus</i>	Water scavenger beetle	4, 5
<i>T. ellipticus</i>	Water scavenger beetle	7, 18
<i>T. glaber</i>	Water scavenger beetle	7, 9
<i>T. lateralis nimbatus</i>	Water scavenger beetle	4, 8
<i>T. natator</i>	Water scavenger beetle	1a, 4, 5, 6, 7, 8, 9c, 10
Lutrochidae	Marsh-loving beetles	
<i>Lutrochus laticeps</i>	Marsh-loving beetle	18
Noteridae	Burrowing water beetles	
<i>Hydrocanthus atripennis</i>	Burrowing water beetle	2b
Psephenidae	Water pennies	
<i>Ectopria nervosa</i>	Water penny	3g, 3h
<i>Psephenus herricki</i>	Water penny	3g, 14, 15, 18
Scirtidae (=Helodidae)	Marsh beetles	15
<i>Scirtes</i> sp.	Marsh beetle	6

Table 2. Aquatic macroinvertebrate taxa and distributions within the Strawberry River System. (cont.)

Scientific Name	Common Name	Location (Table 1)
Order Diptera	True flies	
Athericidae	Athericid flies	
<i>Atherix</i> sp.	Athericid fly	10
Ceratopogonidae	Biting midges	15
Sp. 1	Biting midge	18
<i>Bezzia</i> or <i>Probezzia</i>	No see'um, punkie	4
Chaoboridae	Phantom midges	
<i>Chaoborus</i> sp.	Phantom midge	18
Chironomidae	Non-biting midges, bloodworms	
<i>Procladius</i> sp.	Bloodworm	3h
Sp. 1	Bloodworm	1a, 2b, 3g, 4, 5, 6, 7, 8, 9c, 10, 11b, 12, 14, 15, 18, 21
Dixidae	Dixid midges	
<i>Dixella</i> sp.	Dixid midge	18
Dolichopodidae	Dolichopodid fly	
<i>Rhaphium</i> sp.	Dolichopodid fly	1a
Empididae	Dance flies	
<i>Hemerodromia</i>	Dance fly	21
Ptychopteridae	Phantom craneflies	
<i>Bittacomorpha clavipes</i>	Phantom cranefly	7
Sciomyzidae	Sciomyzid flies	
<i>Sepedon</i> sp.	Sciomyzid fly	9c
Simuliidae	Blackflies	2c
<i>Prosimulium</i> sp.	Blackfly	3h
<i>Simulium</i> sp.	Blackfly	1b, 14, 15, 18, 21
Stratiomyidae	Soldier flies	
<i>Stratiomys</i> sp.	Soldier fly	1a, 2b, 4, 10, 18
Tabanidae	Horseflies, deerflies	2c, 14
<i>Apatolestes</i> sp.	Horsefly	11b, 12
<i>Chrysops</i> sp.	Horsefly	3g, 6
<i>Hybomitra</i> sp.	Horsefly	1b
<i>Tabanus</i> sp.	Horsefly	9c, 21
Tipulidae	Craneflies	
<i>Hexatoma</i> sp.	Cranefly	1a, 21
<i>Tipula</i> sp.	Cranefly	1a, 1b, 3g, 3h, 10, 11b, 12, 18
Total taxa = 313		

**Aquatic Macroinvertebrates of the Strawberry River System in North-central Arkansas**

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